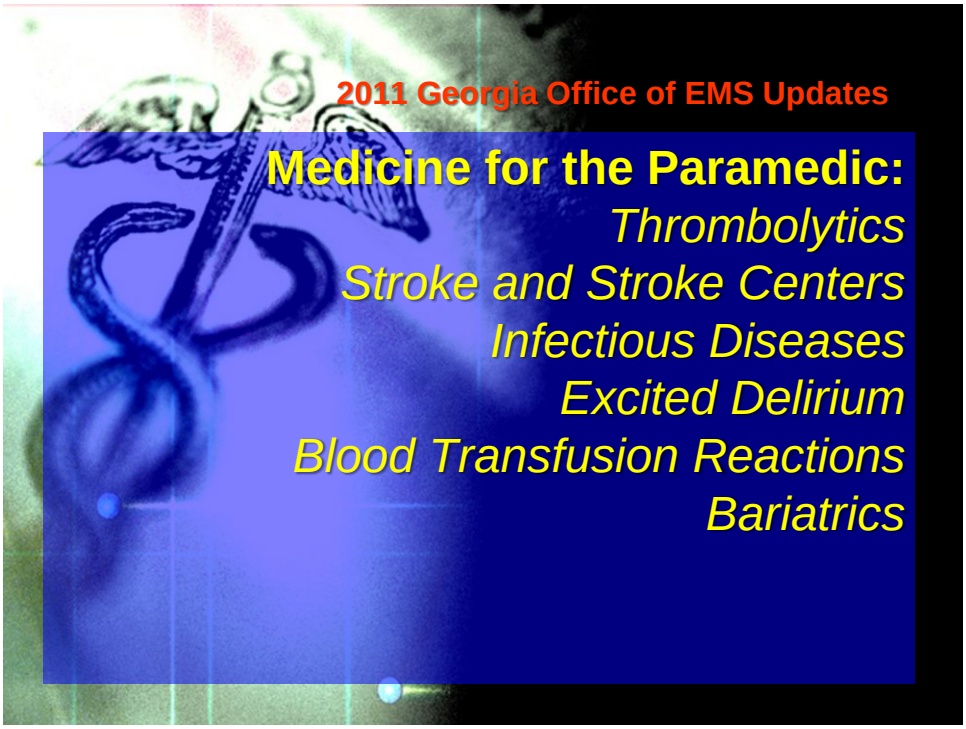
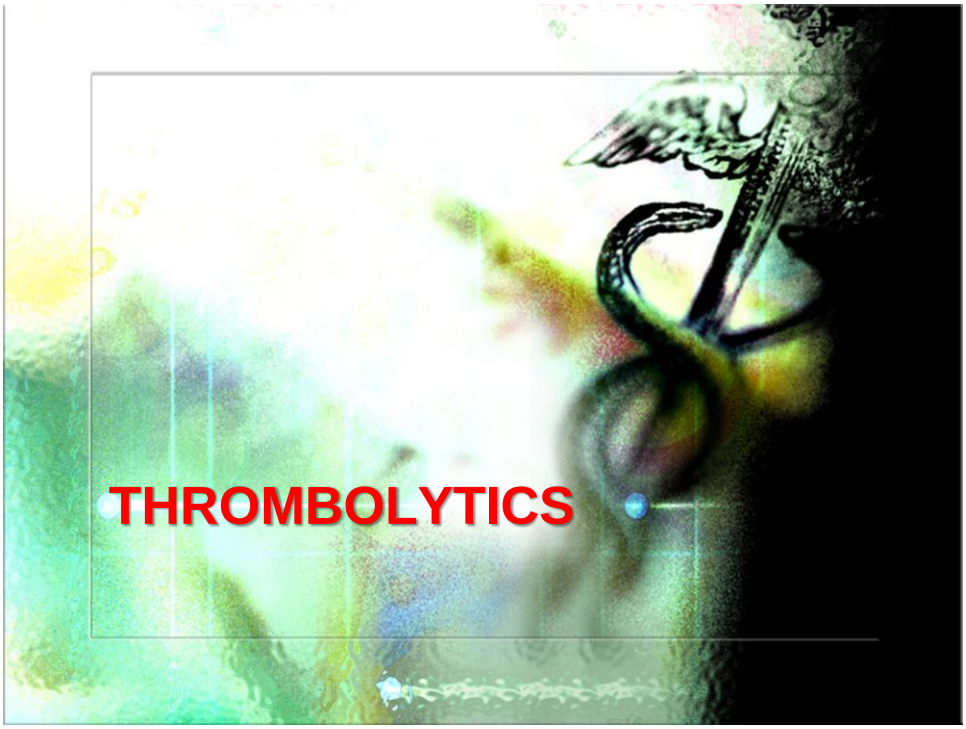


Special Thanks

- **Richard Kalasky**
  - Jones and Bartlett Publishing
- **Alana Sulka**
  - Director of Epidemiology, East Metro Health District
- **Farrah Machida, MSPH**
  - District Epidemiologist, East Metro Health District



Should Paramedics Give Thrombolytics??

- Multiple studies have shown that paramedics can ‘diagnose’ myocardial infarctions with 12-lead ECGs
- Multiple studies have shown that pre-hospital thrombolysis significantly reduces the time it takes to get thrombolysis and the mortality of the patients (mortality for thrombolysis can go up the longer you wait)

STREAM-Strategic Reperfusion (With Tenecteplase and Antithrombotic Treatment) Early After Myocardial Infarction

- Arm 1 (experimental):
  - Early tenecteplase, clopidogrel and enoxaparin followed by routine or rescue coronary intervention
- Arm 2:
  - Standard primary PCI
- Study Start Date: March 2008
- Estimated Primary Completion Date: April 2012

Pre-hospital Administration of Thrombolytic Therapy With Urgent Culprit Artery Revascularization (PATCAR)

- Arm 1 (experimental):
  - Drug: Retavase 10 U IV Bolus
  - Procedure: Angioplasty/Heart Catheterization
  - Device: Drug eluting stent placed in heart attack related artery
- Arm 2:
  - Procedure: Angioplasty/Heart Catheterization
  - Device: Drug eluting stent placed in heart attack related artery
- Study Start Date: November 2003
- Estimated Primary Completion Date: December 2011

Part 10: Acute Coronary Syndromes : 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care

Acute Coronary Syndromes

1

Symptoms suggestive of ischemia or infarction

2

EMS assessment and care and hospital preparation:

- Monitor, support ABCs. Be prepared to provide CPR and defibrillation
- Administer aspirin and consider oxygen, nitroglycerin, and morphine if needed
- Obtain 12-lead ECG; if ST elevation:
  - Notify receiving hospital with transmission or interpretation; note time of onset and first medical contact
- Notified hospital should mobilize hospital resources to respond to STEMI
- If considering prehospital fibrinolysis, use fibrinolytic checklist

Prehospital Fibrinolytic Checklist

Step 1 — Has patient experienced chest discomfort for greater than 15 minutes and less than 12 hours?

YES / NO

Does ECG show STEMI or new or presumably new LBBB?

YES / NO (STOP)

Step 2 — Are there contraindications to fibrinolysis?
If ANY one of the following is checked YES, fibrinolysis MAY be contraindicated.

Systolic BP >180 to 200 mm Hg or diastolic BP >100 to 110 mm Hg	YES	NO
Right vs left arm systolic BP difference >15 mm Hg	YES	NO
History of structural central nervous system disease	YES	NO
Significant closed head/facial trauma within the previous 3 weeks	YES	NO
Stroke >3 hours or <3 months	YES	NO
Recent (within 2-4 weeks) major trauma, surgery (including laser eye surgery), GI/GU bleed	YES	NO
Any history of intracranial hemorrhage	YES	NO
Bleeding, clotting problem, or blood thinners	YES	NO
Pregnant female	YES	NO
Serious systemic disease (eg, advanced cancer, severe liver or kidney disease)	YES	NO

Step 3 — Is patient at high risk?
If ANY one of the following is checked YES, consider transfer to PCI facility.

Heart rate ≥100/min AND systolic BP <100 mm Hg	YES	NO
Pulmonary edema (rales)	YES	NO
Signs of shock (cool, clammy)	YES	NO
Contraindications to fibrinolytic therapy	YES†	NO
Required CPR	YES	NO

†Consider transport to primary PCI facility as destination hospital.

Which ones to give?

- Alteplase (Activase)
- Reteplase (Retavase)
- Tenecteplase (TNKase)
- Anistreplase (Eminase)
- Streptokinase (Kabikinase, Streptase)
- Urokinase (Abbokinase)
- Anisoylated Purified Streptokinase Activator Complex (APSAC)

Dosages?

- Vary widely
- Some have very stringent time frames
- Consult the manufacturer's guidelines for the Thrombolytic you are using

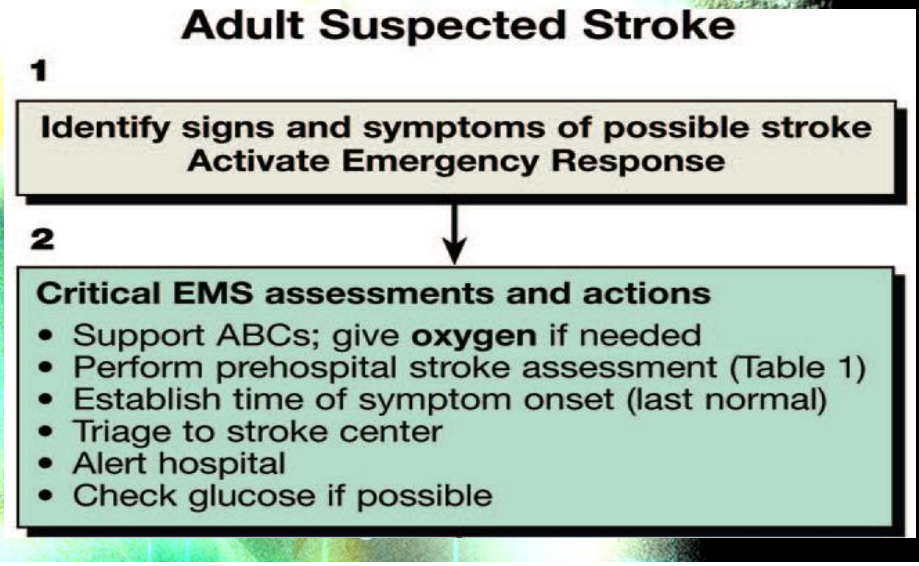
The Importance of Medical Direction

- Medical Direction is who ultimately decides the dosing regimen
- Proper On-Line Medical Direction is paramount
  - Serious harm (death from GI Bleed, Head Bleed, etc) can result from improper patient selection

The 7 D's of Stroke Care

- Detection: Rapid recognition of stroke symptoms
- Dispatch: Early activation and dispatch of emergency
- medical services (EMS) system by calling 911
- Delivery: Rapid EMS identification, management, and
- transport
- Door: Appropriate triage to stroke center
- Data: Rapid triage, evaluation, and management within the emergency department (ED)
- Decision: Stroke expertise and therapy selection
- Drug: Fibrinolytic therapy, intra-arterial strategies
- Disposition: Rapid admission to stroke unit, critical-care unit

Part 11: Adult Stroke : 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care



Cincinnati Prehospital Stroke Scale

- Facial droop (have patient show teeth or smile)
  - Normal—both sides of face move equally
  - Abnormal—one side of face does not move as well as the other side
- Arm drift (patient closes eyes and holds both arms straight out for 10 seconds)
  - Normal—both arms move the same or both arms do not move at all (other findings, such as pronator drift, may be helpful)
  - Abnormal—one arm does not move or one arm drifts down compared with the other
- Speech (have the patient say "you can't teach an old dog new tricks")
  - Normal—patient uses correct words with no slurring
  - Abnormal—patient slurs words, uses the wrong words, or is unable to speak

Los Angeles Prehospital Stroke Screen

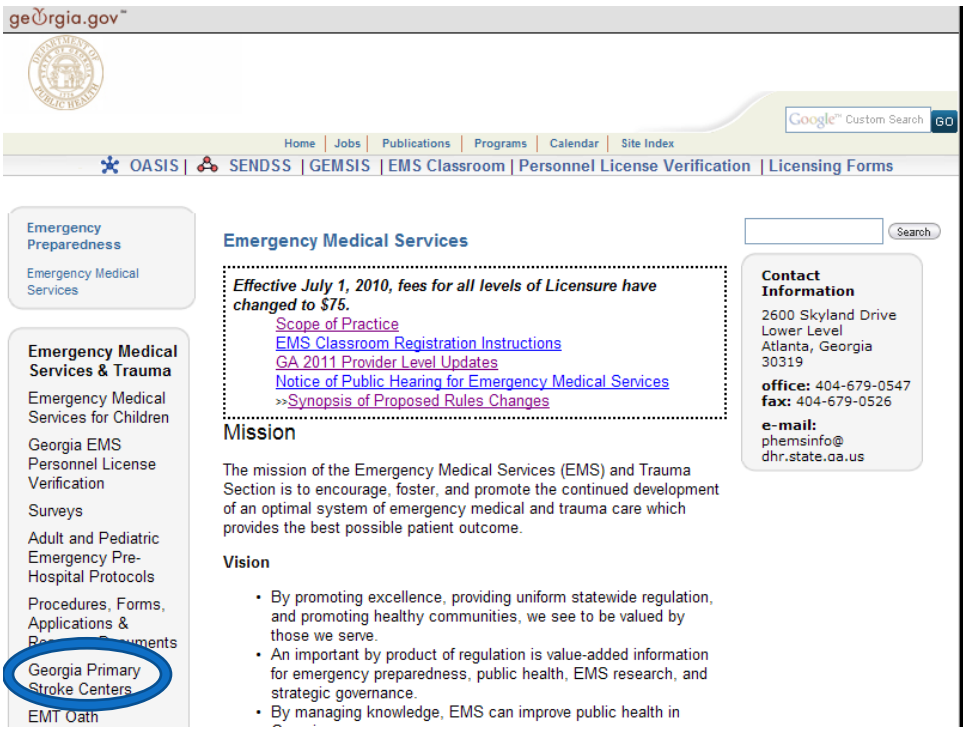
TABLE 11-26 Los Angeles Prehospital Stroke Screen*

Criteria	Yes	Unknown	No
1. Age > 45 y	❑	❑	❑
2. History of seizures or epilepsy absent	❑	❑	❑
3. Symptoms < 24 h	❑	❑	❑
4. At baseline, patient is not wheelchair bound or bedridden	❑	❑	❑
5. Blood glucose between 60 and 400 mg/dL	❑	❑	❑
6. Obvious asymmetry (right vs left) in any of the following three exam categories (must be unilateral):	❑	❑	❑
	Equal	**Right Weak**	**Left Weak**
Facial smile/grimace	❑	❑ Droop	❑ Droop
Grip	❑	❑ Weak grip ❑ No grip	❑ Weak grip ❑ No grip
Arm strength	❑	❑ Drifts down ❑ Falls rapidly	❑ Drifts down ❑ Falls rapidly

*Interpretation: If criteria 1 through 6 are marked yes, the probability of a stroke is 97%.

Stroke Centers

- "Specialty Care Center" means a licensed hospital dedicated to a specific sub-specialty care including, but not limited to, trauma, **stroke**, pediatric, burn and cardiac care.
- New Rule Section for EMS in Georgia – "Stroke Centers"
  - Allows for designation of Primary Stroke Centers and Remote Treatment Stroke Centers



Classification of Microorganisms

TABLE 19-1 Classification of Microorganisms

Organism	General Information	Cell Wall/ Cell Membrane Components	Drug Classes, Groups of Actions (Use)	Medication Examples
Bacteria	Prokaryote vs eukaryote: prokaryotes Cellularity: unicellular Reproduction: binary fission	Peptidoglycan cell wall No sterols in the membrane (except *Mycoplasma*) Mycolic acid in the cell wall of mycobacteria	Cell wall synthesis inhibitors • Beta-lactams • Glycopeptides Protein synthesis inhibitors • Tetracyclines • Aminoglycosides • Macrolides DNA/RNA synthesis inhibitors • Quinolones or fluoroquinolones Alter cell membrane permeability Antimetabolites • Sulfonamides	 Penicillins and cephalosporins Vancomycin (Lyphocin, Vancocin, Vancophed) Doxycycline (Vibramycin, Pentostat) Amikacin (Amikin) and gentamicin (Garamycin) Erythromycin (many brand names) Ciprofloxacin (Ciloxan, Cipro) Polymyxin B (Aerosporin) Sulfamethoxazole (Gantanol)
Viruses	Prokaryote vs eukaryote: neither Cellularity: acellular Reproduction: N/A	None (lack cells)	Viral attachment inhibitor Viral uncoating inhibitor (influenza) Neuraminidase inhibitors (influenza) DNA/RNA synthesis inhibitors (HIV, herpes, cytomegalovirus) Protease inhibitors (HIV) Interferon (hepatitis)	Enfuvirtide (Fuzeon) Amantadine (Symmetrel) and rimantadine (Flumadine) Zanamivir (Relenza) and oseltamivir (Tamiflu) Acyclovir (Zovirax), ganciclovir (Cytovene), and zidovudine (AZT, Retrovir) Indinavir (Crixivan) and saquinavir (Fortovase, Invirase) Interferon (Intergen)
Protozoa	Prokaryote vs eukaryote: eukaryotes Cellularity: unicellular Reproduction: asexual or sexual	No cell wall	Antimetabolites DNA synthesis inhibitors • Nitroimidazoles Unknown mode of action • Quinolines	Trimethoprim-sulfamethoxazole combination (Septra) Metronidazole (Flagyl, Metrogel) Chloroquine (Aralen) and quinacrine
Helminths	Prokaryote vs eukaryote: eukaryotes Cellularity: multicellular Reproduction: complex	No cell wall	Antimetabolites • Benzimidazole	 Mebendazole (Vermox) and Praziquantel (Biltricide)
Fungi	Prokaryote vs eukaryote: eukaryotes Cellularity: unicellular (yeasts) or multicellular (molds) Reproduction: asexual or sexual	Chitin cell wall Unique sterols (ergosterol) in the membrane	Ergosterol synthesis inhibitors • Azoles • Allylamines Alters cell membrane permeability • Polyene Mitotic inhibitor (prevents cell replication)	 Ketoconazole (Nizoral) and miconazole (Monistat, Micatin) Terbinafine (Lamisil) Amphotericin B (Fungizone) Griseofulvin (Fulvicin, Grisactin, Grisfulvin)
Prions	Prokaryote vs eukaryote: neither Cellularity: acellular Reproduction: N/A	None (lack cells)	N/A	N/A

Abbreviations: HIV, human immunodeficiency virus; N/A, not applicable.

Influenza (the "flu")

- Causes acute respiratory illness that lasts 7–10 days
- Responsible for 36,000 deaths and 100,000 hospitalizations per year
- Can be transmitted between humans and animals

Influenza

- Influenza A is most common.
  - Virus mutates slightly so that immune system doesn't recognize subsequent infections.
  - Broken into subtypes
- Influenza B – evolves slower than A
  - regional/ epidemics every few years – no subtypes
- Influenza C - rare
- Variations are monitored by the World Health Organization (WHO) and Centers for Disease Control (CDC).

http://www.emsworld.com/print/EMS-World/CE-Article---Infectious-Diseases---Annual--Recurrent-and-Emerging/1$15881

What is this H and N stuff?

- Influenza A Surface Proteins
  - H (hemagluttinin)
    - 16 subtypes (H1-H16)
  - N (neuraminidase)
    - 9 subtypes (N1-N9)
  - Common types: H1N1 and H3N2
  - "Swine Flu" in 2009 was a novel form of H1N1
  - Avian Influenza ("bird flu" (H5N1) – rarely infects humans but there have been cases

http://www.cdc.gov/flu/about/viruses/types.htm

Influenza Landmarks in Humans in this Century

TABLE 19-3 Influenza Landmarks in Humans During This Century

Year	Colloquial Name (Subtype)	Source	Impact
Pandemics			
1918	Spanish flu (H1N1 viruses such as swine flu)	Possible emergence from swine or an avian host of a mutated H1N1 virus	Pandemic with > 20 million deaths globally
1957	Asian flu (H2N2)	Possible mixed infection of an animal with human H1N1 and avian H2N2 virus strains in Asia	Pandemic, H1N1 virus disappeared
1968	Hong Kong flu (H3N2)	High probability of mixed infection of an animal with human H2N2 and avian H3Nx virus strains in Asia	Pandemic, H2N2 virus disappeared
1977	Russian flu (H1N1)	Source unknown but virus is almost identical to human epidemic strains from 1950; reappearance detected at almost the same time in China and Siberia	Benign pandemic, primarily involving persons born after the 1950s; H1N1 virus has cocirculated with H3N2 virus in humans since 1977
Incidents With Limited Spread			
1976	Swine flu (H1N1)	United States/New Jersey; virus enzootic in US swine herds since at least 1930	Localized outbreak in military training camp, with one death
1986	(H1N1)	The Netherlands; swine virus derived from avian source	One adult with severe pneumonia
1988	Swine flu (H1N1)	United States/Wisconsin; swine virus	Pregnant woman died after exposure to sick pig
1993	(H3N2)	The Netherlands; swine reassortant between old human H3N2 (1973/1975-like) and avian H1N1	Two children with mild disease; fathers suspected of transmitting the virus to the children after being infected by pigs
1995	(H7N7)	United Kingdom; duck virus	One adult with conjunctivitis
1997	Avian flu (H5N1)	Hong Kong; poultry virus	Since 2003, 421 cases worldwide with 257 deaths
2009	Novel H1N1	Mexico	At publication, ~ 45,000 cases and > 600 deaths in the United States; > 360,000 cases and > 4,000 deaths worldwide

Source: Modified from Snacken R, Kendal AP, Haaheim LR, Wood JM. The next influenza pandemic: lessons from Hong Kong, 1997. *Emerg Infect Dis*. 1999;5(2):195-203.

Emerging Infectious Diseases
(1 of 2)

- Vaccinations and antibiotics have reduced the number of infectious diseases, but they have also made us complacent.
- Emerging diseases have been aided by human ability to travel, overuse of antibiotics, and abuse of antimicrobials.

Emerging Infectious Diseases
(2 of 2)

- Infections are known to play a role in peptic ulcer disease, cervical cancer, and chronic liver disease.
- Problematic in persons with compromised immune systems

Post-antibiotic Era (1 of 4)

- Almost all pathogenic bacteria have shown resistance to antibiotics.
- Contributing factors
  - Misuse of antibiotics
  - Poor infection control
  - Importation or intrusion of already-resistant strains

Post-antibiotic Era (2 of 4)

- Misuse of antibiotics
  - Antibiotics used to treat viral infections destroy normal flora, allowing resistant strains to dominate.
  - 80 million antibiotics prescriptions written each year for viral upper respiratory infections, against which they are ineffective

Post-antibiotic Era (3 of 4)

- Misuse of antibiotics (continued)
  - Patients must be advised not to ask for prescriptions for viral infections.
  - Patients must be advised to take all of a prescription, even if feeling better.
  - Patients should never use leftover antibiotics.

Post-antibiotic Era (4 of 4)

- Poor infection control
  - Health care workers are a major source of cross-infection between critically ill patients.
  - CCTP must always use proper sanitation and hand washing techniques.

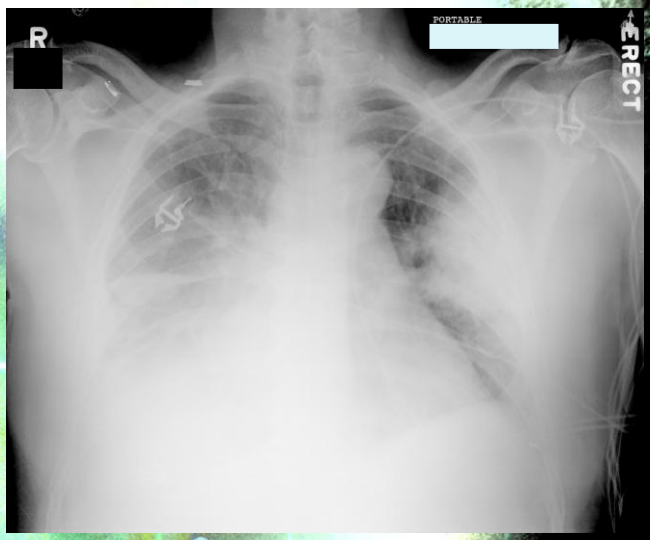
Examples of Resistant Bacteria
(1 of 5)

- Methicillin-resistant *S aureus* (MRSA)
  - Colonizes a variety of tissues causing infections such as cellulitis, cutaneous abscesses, wound infections, osteomyelitis, septic arthritis, endocarditis, pneumonia and septicemia
  - Risk factors include dialysis, diabetes, use of injectable drugs, and a history of antibiotic use.

Examples of Resistant Bacteria
(2 of 5)

- Methicillin-resistant *S aureus* (MRSA) (continued)
  - Transmitted by direct contact with infected patients
  - CCTP should avoid direct contact with anyone with a known MRSA infection.

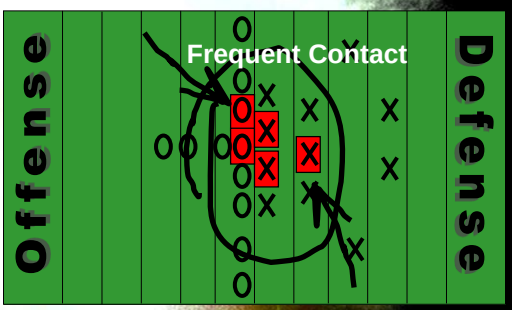
CA-MRSA Necrotizing Pneumonia



Courtesy of M. Farley

CDC's "5 C's" of CA-MRSA Transmission

Crowding



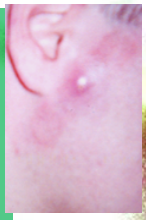
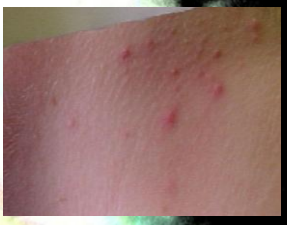
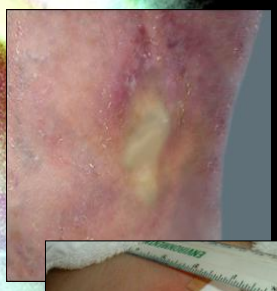
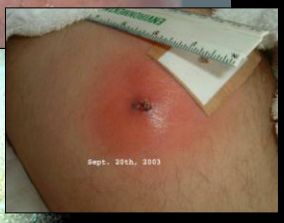
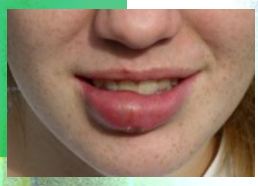
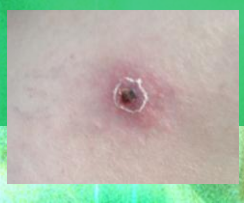
Compromised Skin

Contaminated Surfaces and Shared Items

Cleanliness

Manifestations of MRSA Infections

- Often mistaken for spider bites
- Only way to confirm is through a wound culture

Examples of Resistant Bacteria

(3 of 5)

- Vancomycin-resistant *Enterocci*
  - Normally found in the intestinal tract
  - Antibiotic-resistant strains have become a major source of nonsocomial infection in the United States.
  - Bacteria rarely cause illness in healthy persons.
  - Transmission by person-to-person contact

Examples of Resistant Bacteria
(4 of 5)

- Rickettsial diseases
  - Transmitted by tick bite
  - Blood transmission is possible.
  - Causes Rocky Mountain spotted fever, ehrlichiosis, and anaplasmosis
  - Can cause long-term health problems
  - Prevention by wearing insect repellent with DEET

Examples of Resistant Bacteria
(5 of 5)

TABLE 19-8 Initial Signs and Symptoms of Tick-Borne Rickettsial Diseases

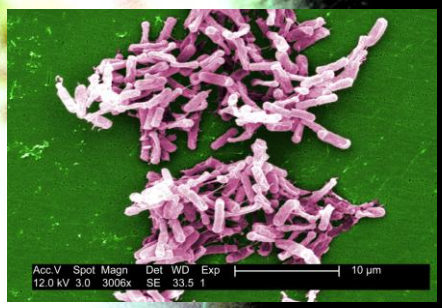
Anaplasmosis	Ehrlichiosis		Rocky Mountain Spotted Fever
Anaplasma phagocytophilum (anaplasmosis)	*Ehrlichia chaffeensis* (ehrlichiosis)	*Ehrlichia ewingii* (infection)	*Rickettsia rickettsii*
Fever	Fever	Fever	Fever
Headache	Headache	Headache	Headache
Malaise	Malaise	Malaise	Malaise
Muscle aches	Muscle aches	Muscle aches	Muscle aches
Vomiting		Vomiting	Vomiting
		Nausea	Nausea
			Loss of appetite
Rare rash	Rash in < 30% of adults and approximately 60% of children	Rare rash	Maculopapular rash approximately 2-4 d after onset of fever in 50%-60% of adults (and > 90% of children); might involve the palms and soles

Source: Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/ticks/symptoms.html. Accessed July 13, 2009.

Clostridium difficile cont.

a.k.a. "C. diff"

- Acquired from the environment or by fecal-oral transmission from colonized people.
- Colonization rates in healthy neonates & infants as high as 50%
- Colonization less than 5% for those over 2 years



Reservoirs for *C. diff*

- Hospitals
- Nursing homes
- Child care facilities

Patients at an Increased Risk for *C. difficile*-Associated Disease?

The risk for disease increases in patients with:

- antibiotic exposure
- gastrointestinal surgery/manipulation
- long length of stay in healthcare settings
- a serious underlying illness
- immunocompromising conditions
- advanced age

C. Diff Transmission

- *C. difficile* is shed in feces.
  - Any surface, device, or material (e.g., commodes, bathing tubs, and electronic rectal thermometers) that becomes contaminated with feces may serve as a reservoir.
- *C. difficile* spores are transferred to patients mainly via the hands of healthcare personnel who have touched a contaminated surface or item.
- Rate: Acute care: 3-25/10,000 patient days

Prerequisites for CDI

Antimicrobial Therapy

↓

Disturbed colonic microflora

Acquisition of toxigenic *C. diff*

↓

Toxin A & B production

C. Diff acquired disease (CDAD)

- Advanced Age
- Underlying illness

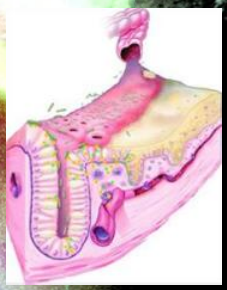
Pathogenesis of *C.diff* Infection (CDI)

Ingestion

Germination

Proliferation

Toxin Production



Sunenshire RH, McDonald LC. *Cleve Clin J Med*. 2006; 73:198

CDI infection Prerequisites

- CDAD due to recent (re) acquisition of *C. diff*
  - Incubation period unknown
  - <7 days to several weeks
- Antimicrobial exposure may or may not precede acquisition

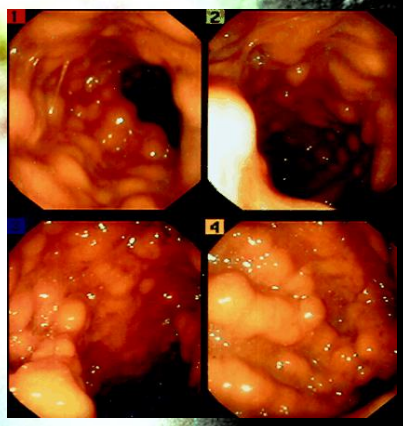
Symptoms of CDI

Symptoms include:

- watery diarrhea (at least three bowel movements per day for two or more days)
- fever
- loss of appetite
- nausea
- abdominal pain/tenderness

CDADs

- pseudomembranous colitis (PMC)
- toxic megacolon
- perforations of the colon
- sepsis
- death (rarely)



Treatment for CDAD

- In 23% of patients, CDAD will resolve within 2-3 days of discontinuing the antibiotic to which the patient was previously exposed.
- The infection can usually be treated with an appropriate course (about 10 days) of antibiotics including metronidazole or vancomycin (administered orally).
- After treatment, repeat *C. diff* testing is not recommended if the patients' symptoms have resolved, as patients may remain colonized.

Prevention of *C.diff* in Healthcare Settings

- Judicious Antibiotic use
- Use Contact Precautions: for patients with known or suspected CDAD:
  - Private rooms
  - Cohort
- Perform Hand Hygiene using either an alcohol-based hand rub or soap and water.
  - Alcohol-based hand rubs may not be as effective against spore-forming bacteria.
- Use gloves when entering patients' rooms and during patient care.
- Use gowns if soiling of clothes is likely.
- Dedicate equipment whenever possible.
- CONTINUE THESE PRECAUTIONS UNTIL DIARRHEA CEASES

Implement an Environmental Cleaning and Disinfection Strategy

- Ensure adequate cleaning and disinfection of environmental surfaces and reusable devices, especially items likely to be contaminated with feces and surfaces that are touched frequently.
- Use an Environmental Protection Agency (EPA)-registered hypochlorite-based disinfectant for environmental surface disinfection after cleaning in accordance with label instructions; generic sources of hypochlorite (e.g., household chlorine bleach) also may be appropriately diluted and used. (Note: alcohol-based disinfectants are not effective against *C. diff* and should not be used to disinfect environmental surfaces.)
- Follow the manufacturer's instructions for disinfection of endoscopes and other devices

TABLE 19-9 Resistance of Infectious Organisms to Disinfectants

Resistance to Disinfection	Class of Organism	Organism Example	Class of Disinfectant	Example of Disinfectant
Most resistance	Spore formers	*Clostridium difficile*	EPA-registered sporicidal	Glutaraldehyde; household chlorine bleach (1:10 dilution)
High resistance	Mycobacteria	TB	EPA-registered tuberculocidal	Combinations of high-percentage hydrogen peroxide (*not* household hydrogen peroxide) and peracetic acid; chlorine dioxide; various phenolics
Medium resistance	Nonenveloped viruses	Norovirus, poliovirus, adenovirus, papilloma viruses	EPA-registered effective agent against norovirus	Household chlorine bleach; Quats; high-percentage hydrogen peroxide (*not* household hydrogen peroxide)
	Cationic detergent (Quats)-resistant bacteria	*Pseudomonas aeruginosa* and *Acinetobacter baumannii*		Household chlorine bleach; high-percentage hydrogen peroxide (*not* household hydrogen peroxide); note: do not use Quats (Pseudomonads are resistant to Quats)
Low resistance*	Fungi	*Trichophyton* and *Aspergillus*	EPA-registered fungicidal	Quats
	Vegetative bacteria	*Staphylococcus aureus* (including MRSA, VRSA, and VRE)	Germicidal, EPA-registered anti-MRSA and anti-VRE	Quats; high-percentage hydrogen peroxide (*not* household hydrogen peroxide); various phenolics
Least resistance*	Enveloped viruses	Influenza, hepatitis B, and HIV	EPA-registered anti-hepatitis B and anti-HIV	Most environmental cleaning agents, including bleach; Quats; phenolics

Abbreviations: EPA, Environmental Protection Agency; HIV, human immunodeficiency virus; MRSA, methicillin-resistant *Staphylococcus aureus*; Quats, quaternary ammonium compounds; TB, tuberculosis; VRE, vancomycin-resistant enterococci; VRSA, vancomycin-resistant *Staphylococcus aureus*.

*Note that low resistance to disinfectant does not mean the organism is not dangerous. It simply means some organisms can be killed easier than other organisms. Assume all patients transported carry infectious pathogens and take necessary steps to decontaminate the equipment and vehicle prior to the next transport.

Data source: Selected EPA-registered disinfectants. US Environmental Protection Agency. January 9, 2009. Available at: http://www.epa.gov/oppad001/chemregindex.htm. Accessed June 29, 2009.

Don’t forget about…

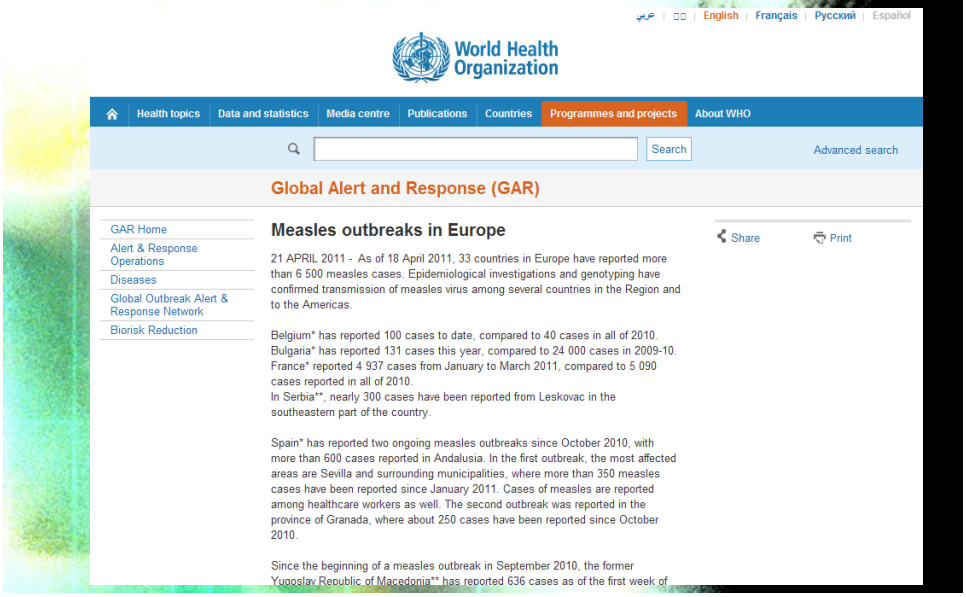
- TB
- Perutssis
- Measles
- Vaccine Preventable Diseases

Tuberculosis

- Not just in the lungs!!
- How its spread…
- MDR TB
- XDR TB

Measles

Measles in Europe



عربي | 中文 | English | Français | Русский | Español

World Health Organization

Health topics | Data and statistics | Media centre | Publications | Countries | Programmes and projects | About WHO

Search | Advanced search

Global Alert and Response (GAR)

- GAR Home
- Alert & Response Operations
- Diseases
- Global Outbreak Alert & Response Network
- Biorisk Reduction

Measles outbreaks in Europe

Share | Print

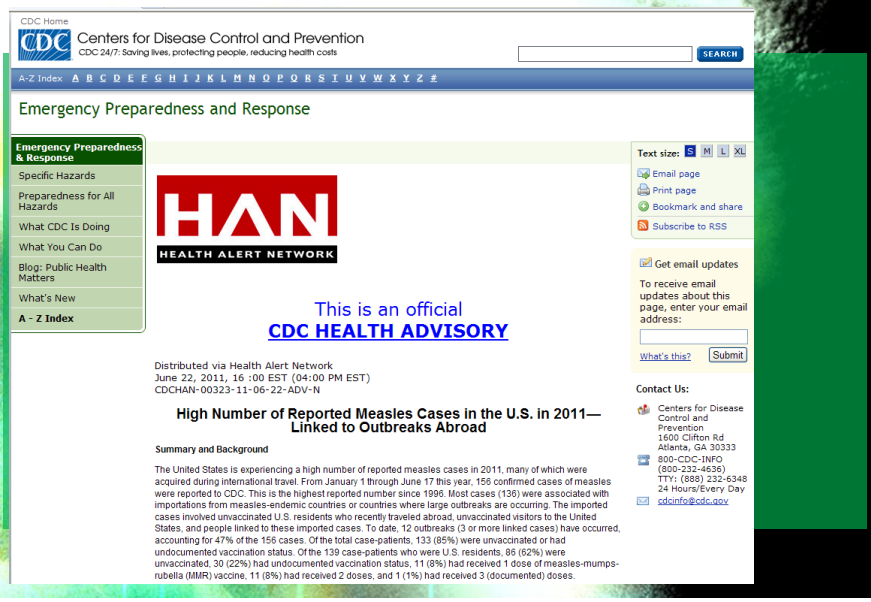
21 APRIL 2011 - As of 18 April 2011, 33 countries in Europe have reported more than 6 500 measles cases. Epidemiological investigations and genotyping have confirmed transmission of measles virus among several countries in the Region and to the Americas.

Belgium* has reported 100 cases to date, compared to 40 cases in all of 2010.
Bulgaria* has reported 131 cases this year, compared to 24 000 cases in 2009-10.
France* reported 4 937 cases from January to March 2011, compared to 5 090 cases reported in all of 2010.
In Serbia**, nearly 300 cases have been reported from Leskovac in the southeastern part of the country.

Spain* has reported two ongoing measles outbreaks since October 2010, with more than 600 cases reported in Andalusia. In the first outbreak, the most affected areas are Sevilla and surrounding municipalities, where more than 350 measles cases have been reported since January 2011. Cases of measles are reported among healthcare workers as well. The second outbreak was reported in the province of Granada, where about 250 cases have been reported since October 2010.

Since the beginning of a measles outbreak in September 2010, the former Yugoslav Republic of Macedonia** has reported 636 cases as of the first week of

Measles in the US



CDC Home

Centers for Disease Control and Prevention
CDC 24/7: Saving lives, protecting people, reducing health costs

SEARCH

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

Emergency Preparedness and Response

- Emergency Preparedness & Response
- Specific Hazards
- Preparedness for All Hazards
- What CDC Is Doing
- What You Can Do
- Blog: Public Health Matters
- What's New
- A - Z Index

Text size: S M L XL

Email page
Print page
Bookmark and share
Subscribe to RSS

Get email updates

To receive email updates about this page, enter your email address:

What's this? Submit

Contact Us:

Centers for Disease Control and Prevention
1600 Clifton Rd
Atlanta, GA 30333

800-CDC-INFO
(800-232-4636)
TTY: (888) 232-6348
24 Hours/Every Day

cdcinfo@cdc.gov

HAN
HEALTH ALERT NETWORK

This is an official
CDC HEALTH ADVISORY

Distributed via Health Alert Network
June 22, 2011, 16 :00 EST (04:00 PM EST)
CDCHAN-00323-11-06-22-ADV-N

High Number of Reported Measles Cases in the U.S. in 2011—Linked to Outbreaks Abroad

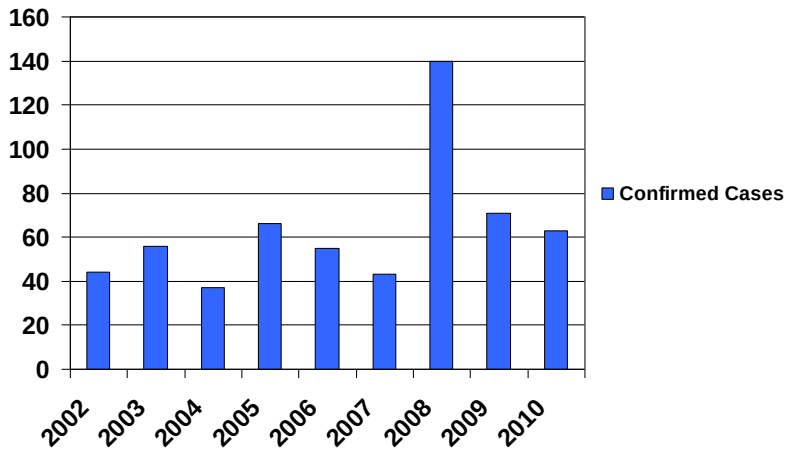
Summary and Background

The United States is experiencing a high number of reported measles cases in 2011, many of which were acquired during international travel. From January 1 through June 17 this year, 156 confirmed cases of measles were reported to CDC. This is the highest reported number since 1996. Most cases (136) were associated with importations from measles-endemic countries or countries where large outbreaks are occurring. The imported cases involved unvaccinated U.S. residents who recently traveled abroad, unvaccinated visitors to the United States, and people linked to these imported cases. To date, 12 outbreaks (3 or more linked cases) have occurred, accounting for 47% of the 156 cases. Of the total case-patients, 133 (85%) were unvaccinated or had undocumented vaccination status. Of the 139 case-patients who were U.S. residents, 86 (62%) were unvaccinated, 30 (22%) had undocumented vaccination status, 11 (8%) had received 1 dose of measles-mumps-rubella (MMR) vaccine, 11 (8%) had received 2 doses, and 1 (1%) had received 3 (documented) doses.

Measles: The Global Picture

- In pre-vaccine era, nearly universal childhood disease
  - 135 million cases, > 6 million deaths annually
- Safe and effective vaccine licensed in the U.S. in 1963
  - From mid-1970s through Expanded Program on Immunization
  - Two dose schedule introduced in 1989
- Global disease burden declined but death toll remained high
  - 1987: 1.9 million deaths
  - 2008: 164,000 deaths
- Remaining global mortality burden mostly in Africa and Asia
  - In 2008, 47 countries accounted for 95% of global mortality

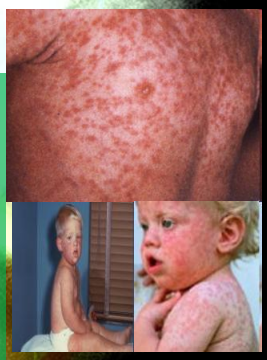
Measles Cases Reported to CDC Nationally, 2002-2009



Measles: The National Picture

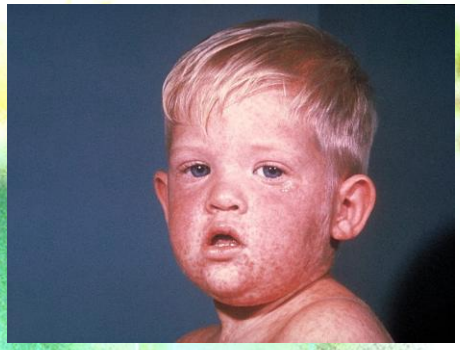
- Measles was declared eliminated from the United States in 2000
- 156 cases in 2011 (as of June 17, 2011)
- 136 (87.2%) were imported or linked to importation
- Among the 139 U.S. residents:
  - 83% were unvaccinated or had undocumented vaccination status
  - 8% had received 1 dose of MMR
  - 8% had received 2 doses of MMR
- 12 outbreaks
- Though, immunization coverage rates for measles vaccine remain high, unvaccinated persons have a greater risk for measles
- Measles is consistently one of the first diseases to reappear when immunization coverage rates fall

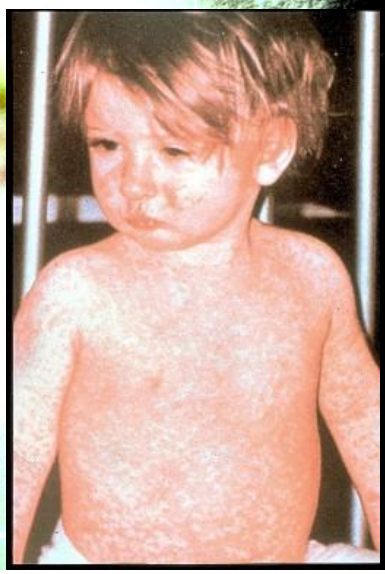
Measles: Review of Clinical Features



- Highly contagious; transmission occurs through respiratory droplets
- Clinical features
  - Incubation 14 days (Range: 7-21 days)
  - Prodrome lasts 2-4 days
    - Stepwise increase in fever to 103º F or higher
    - Cough, coryza, conjunctivitis
    - Koplick spots
- Rash
  - lasts 5-6 days
  - Maculopapular, becomes confluent
  - Begins on face and head and progresses down
- Case-patients are infectious 4 days before to 4 days after rash onset

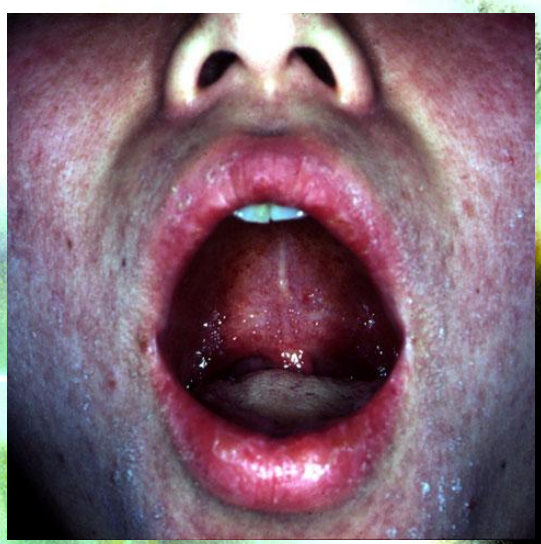
Measles: Rash Appearance on Face and Trunk/Body





*Centers of Disease Control and Prevention

Measles: Koplik's Spots on Oral Mucosa



*Centers of Disease Control and Prevention

Suspect Measles

- Notify ER EARLY!!!
- Call Health Department
- Measles specimens should be collected as soon as possible for the best results:
  - Serum for IgM and IgG serology testing
  - Throat or nasopharyngeal swab for PCR and viral isolation
- ***The suspect measles case should be isolated immediately and airborne transmission precautions should be taken if at a healthcare facility.***
- Obtain a detailed description and timeline of the clinical presentation from the physician and case-patient.
  - Please be sure to get a detailed description of the rash and its progression.

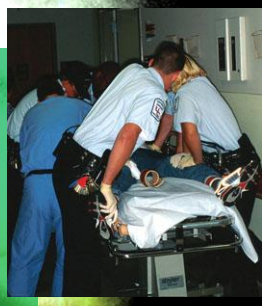
Excited Delirium

- A LIFE threatening medical emergency!
- What is it??
  - A brain disorder
  - **Usually** drug related (crack/cocaine/PCP/meth)
  - Characterized by:
    - Too much dopamine
    - Hyperthermia
    - Paranoid agression

Excited Delirium

- S/S:
  - Dilated pupils
  - Profuse Sweating
  - High body temp
  - Shaking/Shivering
  - INTENSE paranoia/agitation
  - Disorientation/Delusions/Scattered Ideas
  - Irrational speech/Talking to invisible people
  - VIOLENT behavior
  - Run into traffic/Naked/Resists Violently after restraint
  - Unexpected physical restraint
  - Diminished sense of pain

What do we do?



- Verbal de-escalation is not going to work!
- Meds:
  - Benzodiazepines
  - Neuroleptics/Atypical antipsychotics
    - Haldol, Geodon
  - Ketamine
- **THICK** restraints…and get some help!
  - But, **NEVER**:
    - Hobble
    - Prone Restraint
    - Hog-tie
- Monitor patient, Treat at Needed (check for reversible causes)
  - Temp, ECG, Glucose, etc.

If you want to know more…

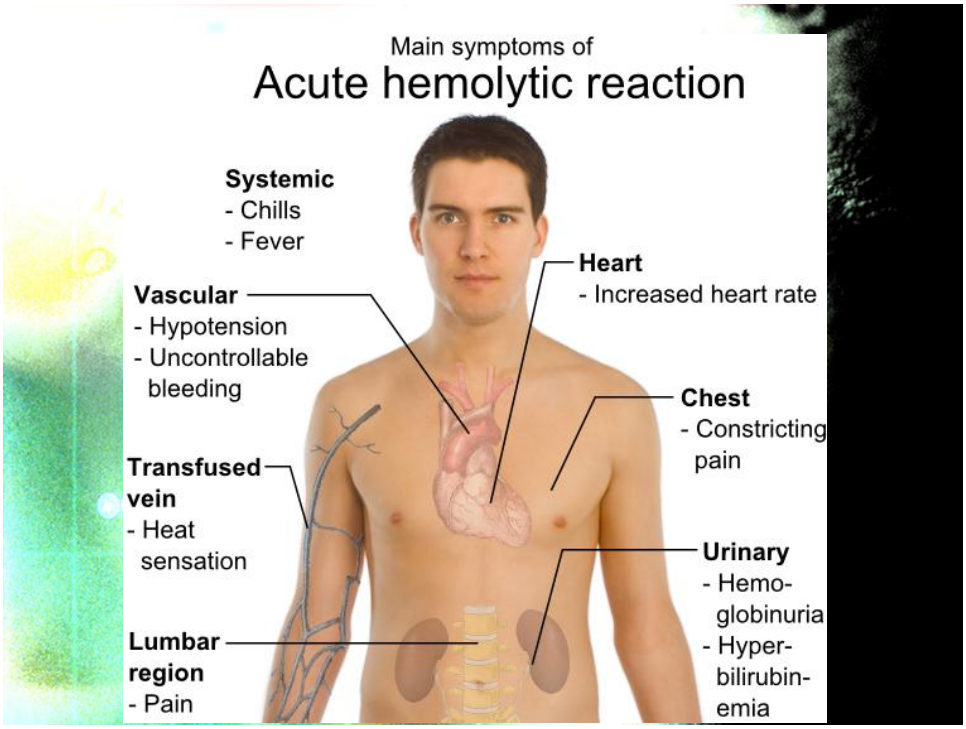
- Deaths In Custody Reporting Act
  - Just Google it…under the Bureau of Justice Statistics
- http://www.exciteddelirium.org
- Check out the Institute for Prevention of In-Custody Deaths
  - http://www.ipicd.com/
- Excellent article at:
  - http://www.emsworld.com/print/EMS-World/Excited-Delirium/1$9165

It is in the New Scope!

Pharmacological Intervention Skills		Interpretive Guidelines
2. Advanced pharmacological skills: venipuncture/vascular access		
a. Obtaining peripheral venous blood specimens	PMDC	*This is either through direct venipuncture or through an existing peripheral IV catheter.*
b. Peripheral IV insertion and maintenance (includes removal as needed)	PMDC	*This includes placement of an INT/Saline lock. Peripheral lines include external jugular veins, but does not include placement of umbilical catheters.*
c. Intraosseus device insertion (includes removal as needed)	PMDC	*This includes placement in both adult and pediatric patients. This also includes both manual and mechanically assisted devices as approved by the local EMS medical director.*
d. Access indwelling catheters and implanted central IV ports for fluid and medication administration.	PMDC	
e. Central line monitoring	PMDC	
3. Administration of medications/fluids		
a. Crystalloid IV solutions	PMDC	*This includes hypotonic, isotonic, and hypertonic solutions as approved by medical direction. This also includes combination solutions (i.e. D5LR, D5NS, etc.).*
b. Administration of hypertonic dextrose solutions for hypoglycemia	PMDC	*Hypertonic dextrose solutions may be given IV/IO.*
c. Administration of glucagon for hypoglycemia	PMDC	*Glucagon may be administered via IM, SC, IV, IO or intranasal routes as approved by the local EMS medical director.*
d. Administration of SL nitroglycerine to a patient experiencing chest pain of suspected ischemic origin	PMD	
e. Parenteral administration of epinephrine for anaphylaxis		
f. Inhaled (nebulized) medications to patients with difficulty breathing and/or wheezing	DC	*Inhaled (nebulized) means atomization of the medication through an oxygen/air delivery device with a medication chamber, or through use of a metered-dose inhaler.*
g. Administration of a narcotic antagonist to a patient suspected of narco overdose	PMDC	*Administration may be via IM, SC, IV, IO, or intranasal routes as approved by the local EMS medical director.*
h. Administration of nitrous oxide (50% nitrous oxide, 50% oxygen m pain relief	PMDC	
i. Vaccine administration	PMDC	
j. Paralytic administration	PMDC*	*Administration of paralytics for the purposes of RSI (Rapid Sequence Induction/Intubation) is not permitted unless the EMS Agency has met RSI requirements promulgated by the OEMST, and has received approval for RSI use from the OEMST. Paramedics are allowed to use paralytics to maintain the paralysis of an already intubated patient, if approved by medical direction.*
k. Administration of other physician approved me	PMDC*	*Paramedics are allowed to give any medication via any enteral or parenteral route, as approved by medical direction (see RSI note above).*
l. Maintain an infusion of blood or blood products	PMDC	

S/S

- Resp:
  - Tachypnea
  - Wheezing
  - Rales
- CV:
  - Brady/Tachcardia
  - SHOCK!
  - Hypotension
- Nervous System:
  - Sense of impending doom
  - Apprehension
- Renal:
  - Concentrated, dark urine
  - Flank pain
- Skin
  - Diaphoresis
  - Urticaria
  - Edema
  - Cyanosis
  - Purpura
- General:
  - Fever
  - Chills
  - Headache
  - Heat at infusion site



TX

- STOP THE TRANSFUSION!
- Change the IV tubing!
- Infuse NS
- Diphenhydramine and Epi PRN

The problem…

- Obesity rate is increasing in the U.S.
  - More patients will be obese
  - More crew members required for obese patients
  - More/specialized equipment for obese patients
    - Stretchers
    - Ramps/winches
    - Ambulances
    - wheelchairs

What do we do?

- Don't ignore the issue…plan for it!
  - Protocols should address bariatric patients
- Request lift assistance! Don't hurt your back!
- Agencies may have a special response unit

Articles

- http://www.emsworld.com/print/EMS-World/Beyond-the-Basics--Bariatric-Emergencies/1$6008
- http://www.jems.com/article/administration-leadership/bariatric-patients-pose-weight